

**EXPRESS MAIL NO.: EV 416036091 US**  
**DEPOSITED ON: September 21, 2005**



**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

<b>Applicants: Kurt R. Francis</b>	)	<b>Atty. Dkt. No: 5671.088</b>
<b>and Sai T. Chu</b>	)	
<b>Application No.: 10/827,136</b>	)	<b>Examiner: Eric Wong</b>
	)	
<b>Filed: April 19, 2004</b>	)	<b>Art Unit: 2883</b>
	)	
<b>For: HERMAPHRODITIC U-GUIDE</b>	)	
<b>ALIGNMENT STRUCTURES</b>	)	
<b>AND METHOD THEREOF</b>	)	
	)	

**Mail Stop - AMENDMENT**  
**Commissioner for Patents**  
**P.O. Box 1450**  
**Alexandria, VA 23313-1450**

**DECLARATION UNDER 37 CFR 1.131**

Sir:

COUNTY OF HOWARD )  
 ) ss.  
STATE OF MARYLAND )

I, Sai T. Chu, do declare as follows:

1. All statements made herein of my knowledge are true and all statements made on information and belief are believed to be true, and further, these statements were made with the knowledge that willful false statements

and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the above-identified application or any patent issued thereon.

2. I am a co-applicant of the patent application identified above and a co-inventor of the subject matter described and claimed therein.

3. Prior to March 8, 2002, we had conceived the invention described and claimed in the above-identified application in this country as evidenced by the following:

- a. Prior to March 8, 2002, I prepared notes and sketches describing the idea of a method of connecting an integrated waveguide circuit component with an optical fiber array comprising the steps of providing an integrated optical waveguide circuit component having input and output waveguides including a subset of at least one u-waveguide structure, providing an optical fiber array having an array of optical fibers, the optical fibers having a coupling end for optical coupling to some of the individual corresponding waveguide ports of the circuit component, positioning the optical fiber array adjacent to the integrated optical waveguide component so that a plurality of photons emitted

from optical fiber array ports are coupled into the respective individual corresponding u-waveguide coupling region on the integrated optical waveguide circuit component and back into the corresponding fiber array, adjusting the position of the optical fiber array to the integrated optical waveguide circuit component so that the sensed value representative of the total optical power of the photons is maximized, in accordance with claim 1 of the above-identified application. A copy of the document is attached hereto as Exhibit A. The date masked from Exhibit A is prior to March 8, 2002.

FURTHER DECLARANT SAYETH NOT.



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Sai T. Chu

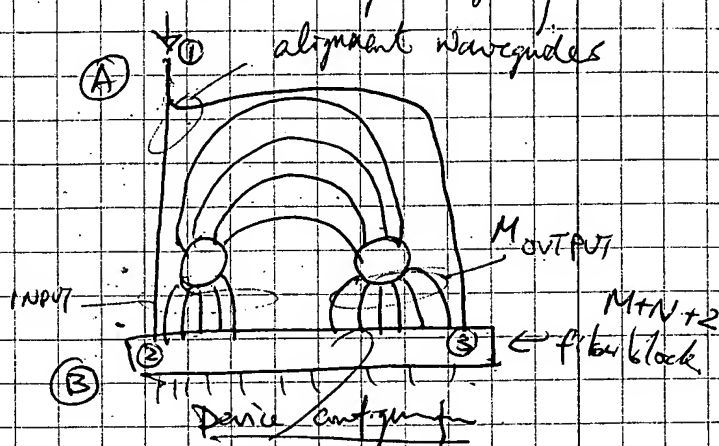
## EXHIBIT

A

Single sided chip <sup>test, measurement, packaging</sup>

Device consists of  $N$  input ports  
 $M$  output ports, both  
 input/output ports are on  
 the same side (B)

Two alignment waveguides (2) & (3)  
 are located on the outer edges  
 of the input & output ports



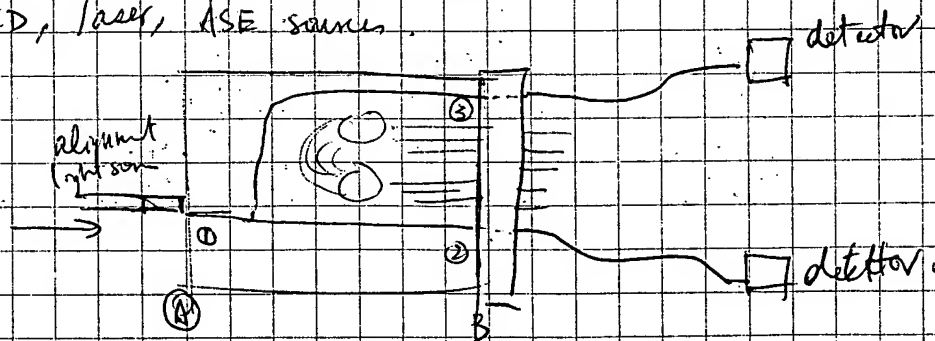
The alignment waveguides are <sup>bring</sup> together  
 to form a signal single waveguide (1) at the  
 opposite end (A) of the device. → the coarse alignment waveguide?

The coarse alignment (1) & the alignment w/g (2) & (3) form a Y-junction.

~~Device~~ H

Alignment procedure:

With the fiber cables connecting to the alignment waveguides connected to  
 detectors, align the ~~input waveguide~~ (1), light source can be any of  
 LED, laser, ASE sources.



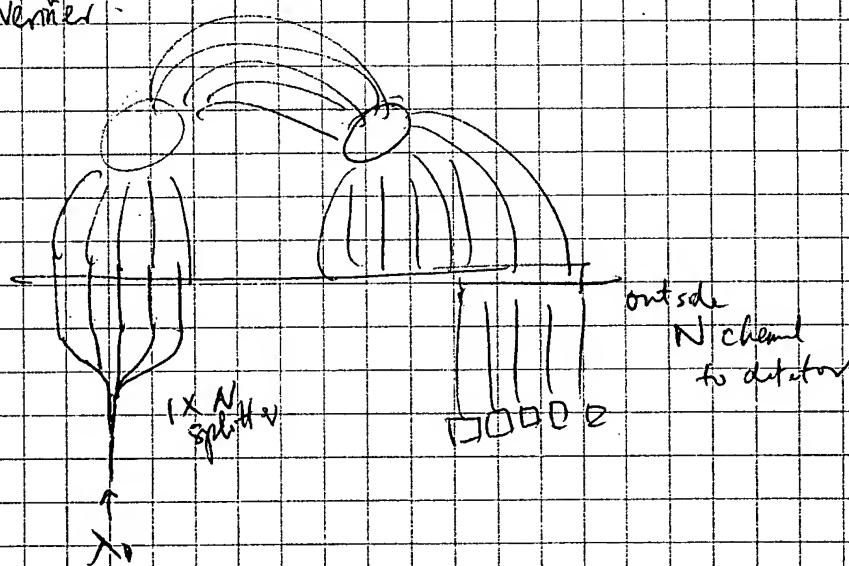
align fiber block to chip to obtain max. power at both  
 detectors

Once the outside waveguides (2) & (3) are align, all waveguides in between  
 the alignment w/gs are align.

Sorting M channel TWG

N input  
Verner

M + 2N output



in good device, device that satisfies center accuracy requirement.  
will have  $\lambda_1$  output at one of the  $N$  outputs detected.

Choose the output with highest output power as the  
1st or last ~~input~~ of the next output point; back calculate  
the input point.